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GLEDITSCHINE, SPURIOUS AND GENUINE.¹

BY EDWARD JACKSON, M. D., PHILADELPHIA, PA.

In publishing my observations on the action of the so-called stenocarpine (in *The Medical News* of Sept. 3, 1887), I stated:

"In studying the action of this drug, one cannot but be struck with its similarity to that of cocaine. * * * This similarity of action raised in my mind the question, whether this new drug possessed any power which would not be possessed by a solution of cocaine to which had been added a portion of one of the stronger mydriatics, as duboisine or hyoscyamine."

It seemed to me then, however, that the drug did "possess certain powers, in degree at least, peculiar to it. My impression is that the solution used, said to be a two per cent. solution is a more powerful anæsthetic than the four per cent. solution of cocaine."

I also thought that while its influence over the accommodation was more powerful than that of homatropine, that the recovery of the accommodation from its effects was more rapid than from any previously known mydriatic, except homatropine.

In this last respect I soon found I had been in error. A few

¹Read before the Philadelphia County Medical Society.

days after that paper was published I came across the records of some experiments which I had made nearly six years ago, and some of the results of which I reported in a paper read before the Medical Society of the State of Pennsylvania in 1882; and among them some trials of weak solutions (1 to 1000 and 1 to 2000) of duboisine and hyoscyamine in my own eyes, where the recovery corresponded exactly to the recovery observed after the use of the alleged new drug. This discovery redoubled my suspicions. I then took twenty-five grains of the solution, dried it over sulphuric acid, and weighed the residue, which I gave to Dr. Henry Leffmann, who dried it still further, and weighed it again; its weight, as reported by him, was 1.62 grains. This demonstrated that the so-called two per cent. solution of "stenocarpine" was not what it purported to be.

In my paper, before referred to, I objected to the name stenocarpine as probably not indicating the real source of the drug, and pointed out that Mr. Goodman's description of the tear blanket tree corresponded with that of the *Gleditschia triacanthos*, or honey locust; and stated that "extracts made from the leaves of the honey locust growing near Philadelphia failed to exhibit any anæsthetic or mydriatic properties." About the same time I wrote to Mr. Goodman asking for specimens of the leaves: and he promised them, but they have not yet been received. Soon after this, however, I obtained specimens of leaves from Jefferson County, Texas, which were pronounced those of the honey locust by Dr. J. T. Rothrock, Prof. of Botany in the University of Pennsylvania, who had been the first to suggest to me that the honey locust might be the tree described. These leaves proved as inert as those obtained in this vicinity.

Shortly after this Dr. J. H. Claiborne published in the *Medical Record* of Oct. 1, 1887, a detailed and illustrated account of the honey locust; stating that Mr. Goodman and Dr. Seward had fully identified it as the source of the new local anæsthetic, and proposing, therefore, to call the "new" alkaloid Gleditschine. The publication of the above facts indicating

the fraudulent character of the "stenocarpine" solution was delayed until some of the genuine Gleditschine could be studied. But, simultaneously, Mr. F. A. Thompson, in the *Medical Age* of Oct. 25, and Dr. John Marshall, in *The Medical News* of Oct. 29, published analyses of the alleged stenocarpine—Gleditschine solution, by which the fraud was fully exposed. They proved that unquestionably the solution contained cocaine and a member of the atropine group. The latter is not, however, atropine itself, as might be inferred from their papers; but on account of the brevity of the paralysis of accommodation it produces, must be, I think, hyoscyamine, duboisine, or daturine.

When talking with Dr. Henry Leffmann about the *Gleditschia triacanthos*, he told me that he thought that it had been the subject of investigation by the late Dr. B. F. Lautenbach, who had published something about it in the *Philadelphia Medical Times*. On looking into the matter, I found that in the issue of that journal for November 23, 1878, just nine years ago to-day, Dr. Lautenbach had published a brief communication entitled "Gleditschine—A New Alkaloid," with the promise that "in a later publication this subject will be treated of more fully. The promise remained unfulfilled, doubtless on account of the early death of this talented, original investigator. But the brief preliminary contribution is of that substantial character which always, sooner or later, proves its value. I make from it the following extracts:

"When, however, an alcoholic extract of the unripe seeds and the portions of the fruit immediately surrounding these (the remainder of the unripe fruit is practically inert) was used, very active poisonous effects were observed: In from five to twenty minutes the frogs were in a profound state of stupor. No reflex movements could be excited by any of the known means, though at that time the motor nerves still remained irritable. This loss of reflex activity was not due to loss of function of the sensory nerves through the direct action of the poison on these structures, as, after ligature of all the blood vessels of a limb, irritation of that limb failed to produce re-

flex movements when the animal was poisoned with the extract. The heart continued to beat for hours after these symptoms appeared. If a not too large dose was given, the animals recovered after being in this state for twenty-four hours." * * * "To isolate the active principle the portions of the fruit used were digested in absolute alcohol and ether, then precipitated with lime, and the alkaline filtrate neutralized with dilute sulphuric acid. The dense precipitate thus obtained was allowed to crystallize. The crystals were dissolved in water, and the alkaloid precipitated by lime." * *

"The crystals which were obtained were elongated rhombs, almost completely insoluble in water, but readily soluble in alcohol. They leave no ash when heated on platinum. The alcoholic solution is alkaline, and with dilute sulphuric acid gives a dense white precipitate. * * * composed of elongated rhombic crystals, whose angle, however, was much smaller than that of the Gleditschine crystals. Both the original crystals and the sulphate produced in frogs and toads the symptoms before described."

"Gleditschin, as I propose to call this new alkaloid, forms salts with sulphuric, nitric, hydrochloric, acetic, and tannic acids. All these salts crystallize in modifications of the rhomb," * * * "The first symptom produced in frogs is a state analogous to sleep. Following this rapid abolition of reflex activity takes place, and respiration ceases. The galvanic irritability of the nerves is much diminished."

After reading this account by Dr. Lautenbach of the substance clearly entitled to the name Gleditschine, I endeavored to obtain some of the unripe fruit, in which, according to Dr. Lautenbach, the drug is to be found. With some difficulty and after considerable delay, a peck of the fruit was obtained, but the pods and seeds were most of them very nearly mature. However, Mr. James A. Kyner, Demonstrator of Chemistry in the Polyclinic, following in the main the method of Dr. Lautenbach, obtained from them a very small amount of a solution of what we believe to be the sulphate of the true Gleditschine. On evaporation it deposits crystals of a narrow rhombic form.

When ammonia is added it gives a precipitate, which presently crystallizes in broader rhombs. On the frog it produced the symptoms narrated by Dr. Lautenbach, though my supply of the solution gave out before the stupor was complete. The symptoms reached their height in fifteen minutes after the hypodermic injection of the solution, were passing off in an hour, and had disappeared entirely in less than three hours. *This solution freely applied to the conjunctiva produced no anaesthesia, or dilatation of the pupil, whatever.*

The analyses and tests above referred to, with several others that have since been published, have pretty well disposed of the alleged new local anaesthetic and mydriatic; and Gleditschine has lost its interest for the ophthalmic surgeon. But the incident, disagreeable as its ending may have been to some of us, is not without its useful lessons.

First. It is shown that such a fraud cannot be carried far even with a drug as difficult of positive chemical identification as cocaine. And every such attempt at fraud can only make more brief the period, and decrease the profit, of succeeding attempts.

Second. It has been demonstrated that cocaine can produce anaesthesia through the unbroken skin; although, as I have pointed out (*loc. cit.*), this is extremely superficial; and "To make a painless incision in tissues anaesthetized in this way, one must do it by repeated superficial cuts with the knife, keeping all the time the cut surface bathed with the solution."

Third. Attention has been drawn to the *Gleditschia triacanthos*, and the genuine Gleditschine discovered and studied nine years ago by Dr. Lautenbach, but recently in a fair way to be forgotten. And in the direction of a further study of this substance lies the probable path of profitable future investigation. The leaves have been proven practically inert, and for several months it may be impossible to obtain specimens of the unripe fruit. But other parts of the plant might be tested for it. In the *Medical Age* of November 10, Dr. Crull states that he has cured gleet with a decoction of the bark of the root of the thorny honey locust (the more common variety), and that

taking a tablespoonful of the decoction himself "caused nausea, giddiness, dimness of sight, cold perspiration, and a prickly or smarting sensation of the tongue and throat. These symptoms continued for nearly three hours, when they gradually abated. The evacuation of the bowels the following morning was very bilious and watery."

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A CASE OF OPTICO-CILIARY NEUROTOMY.

BY D. COGGIN, M. D., SALEM, MASS.

On April 5, 1879, I was consulted by Mrs. Margaret M., aet. 57, Ireland, Housewife, Salem. She had lost sight in the left eye nineteen years ago. I had seen her as an out-patient last November. She then presented symptoms of irido-cyclitis, *vis.*, ciliary redness, much pain and tenderness. T+2. Occlusion of pupil. Iris, *bombee*. No perception of light. Right eye V.=fingers at 5', with photophobia and lachrymation.

Enucleation was then and subsequently positively declined, but consenting to a neurotomy, she was admitted into the Salem Hospital. Under ether the external rectus was divided (in place of the internal, as marked convergence was present).

A ligature was passed through the tendon, as in the operation for advancement. The optic nerve was severed, the speculum withdrawn and pressure applied on the eye-ball through the closed lids for a few minutes, which rendered the haemorrhage insignificant. The scissors were again introduced and the ciliary nerves cut through, when the eye was so greatly protruded by the gush of blood into the orbit as to make it doubtful if enucleation could be avoided. The severed ends of the external rectus, with the conjunctiva, were brought together, the internal rectus was cut and a pressure bandage was then applied.

April 6. Cornea anaesthetic. Patient comfortable. No chemosis, but an extensive ecchymosis, the blood involving the cellular tissue around both eyes and hanging like a bag beneath the left cheek. Globe still very prominent.

Blood in front of occluded pupil; none gravitated to floor of anterior chamber. No constitutional disturbance, nor was there any later. Patient discharged on May 2; the exoph-

thalamus was now gone. A little blood at the bottom of the anterior chamber. She says the eye is tender inferiorly. No photophobia now in the right eye.

In Novembor the patient was in the hospital owing to a bronchitis. The eye was then quiet and anæsthetic.

Aug. 4, 1882. Patient states that the left eye is tender on pressure (?) T. diminished.

June 22, 1883. At times "severe pain" in left eye. Is conscious when the eye is touched with a probe, but the sensation is not painful. Eye-ball undergoing atrophy.

October, 1887. Cornea clear. Atrophy of iris below, T—. No pain complained of on pressing against cornea with a probe. No redness, and no discomfort in the eye. The right eye is apparently normal. Thus it appears that the relief following the neurotomy, eight and one-half years ago, has continued to the present time.

THE BICHLORIDE OF MERCURY IN THE TREATMENT OF EXTERNAL DISEASES OF THE EYE.

BY ADOLF ALT, M. D., ST. LOUIS.

Starting from the theoretical standpoint that disease is probably in most cases caused by the action of a living *materia peccans* upon the tissues of the human body, and that such a living *materia peccans* will be more readily found to act on the parts continually exposed to the air, oculists in common with general surgeons have for years adopted antiseptic and aseptic measures. The probability that all diseases of the conjunctiva and lids are due to the action of microbes is very great. Numerous pathogenic (and, as far as known, non-pathogenic) microbes may be found even in the healthy conjunctival sac. In common with others I have, therefore, for a prolonged period tried to find out which of the many germicides now in use and generally approved would be the most suitable in the treatment of the diseases of the lids and conjunctiva. To be sure, many of the remedies in use in ophthalmic practice before the antiseptic period virtually belong to the germicides, and their beneficial action may now be safely attributed to such qualities. Without going any further into this question I want to state that carbolic acid, iodoform, iodol and boracic acid have all in turn been carefully tried by me, and that the results in my experience have not been altogether satisfactory. The remedy which I consider by far superior to those just mentioned, is the bichloride of mercury. The strength in which I have been in the habit of using it for over a year varies from one part in 2500 to 1 part in 5,000 (or even in 10,000 in children). Sometimes I found that in cases in which I wanted to use the first named solution, I had to dilute it on account of the severe pain it caused. It is a strange fact

that, while most people declare the instillation of a 1 in 2500 solution produces no more disagreeable feeling than a drop of water would cause, others (luckily but few) complain of an excruciating pain following directly upon the instillation. In these latter cases even a weaker solution is usually rather painful. The following synopsis of affections in which I have tried the bichloride of mercury and the results obtained will, perhaps, prove of some value to others.

I direct the patients in all cases to have the solution *poured* into the eyes while they are in the recumbent position, and in such a quantity, that it is sure to reach all the parts of the conjunctival sac. This may be aided by manipulating the upper lids.

In *simple conjunctivitis* with hardly any discharge, but heat and dryness of the lids, especially in the evenings, where boracic acid seems to be useless, instillations of the bichloride of mercury solution morning and evening seem to act well without exception.

In *acute catarrhal conjunctivitis*, in which I thought the relief should be easily obtained by the germicide, my general experience has been that its use alone, even when frequently instilled, was not altogether satisfactory. Yet I think it a decided help in the treatment of these cases as an adjunct to the nitrate of silver and ice.

In *chronic catarrhal conjunctivitis* its action is very agreeable to most patients, and often no other remedy need be applied.

In *phyctænular conjunctivitis* it seems, strange to say, to have a bad influence, and I no longer use it. Calomel and the yellow oxide of mercury are decidedly superior in their action on this disease.

In all *purulent* forms of conjunctivitis including the gonorrhœal ones of the new-born and adult, the frequent irrigation of the conjunctival sac with a 1 in 2500 solution of the bichloride of mercury seems, in my experience, to be without a rival. Although in some very severe cases I have thought best to apply the nitrate of silver for some days aside from the subli-

mate instillations, I have in many cases used nothing but the sublimate solution. The latter I had freely poured into the eyes every half hour, having besides iced compresses applied day and night. The results have been very satisfactory. No ulceration of the cornea has so far occurred in my practice under this treatment, even in dispensary practice, when the case was seen early enough.

The same excellent result (see AM. JOUR. OF OPHTHALMOLOGY, Vol. IV, page 44) I have obtained in these cases of *diphtheria* of the conjunctiva. The number of cases is, however, too small to make it upon one to advise his colleagues to simply rely on this experience.

In the treatment of *trachoma*, especially of recent cases, I consider the instillation of the sublimate solution, morning and night, of a great help, and I always order it to be so used.

In *blepharitis ciliaris* the instillation is also of value; yet, more on account of the conjunctivitis accompanying the blepharitis. However, the application of cotton soaked in the sublimate solution during the night seems to act very beneficially.

During the last few months an item is going through the medical journals recommending on what seems good authority the use of boracic acid in *hordeolum*. I must say, this recommendation astonished me, since I had thoroughly tried this remedy at least as a prophylactic measure after having opened a hordeolum, and had failed to see any benefit from it. I must, however, state almost the same of the prophylactic qualities of sublimate in this affection, as I have in several cases seen new styes being formed while the instillations of a sublimate solution were used. In other cases none but the original stye were formed; yet, the same experience is often made, where no prophylactic remedy is used.

In *parenchymatous keratitis*, caused by inherited syphilis, the instillations of a sublimate solution do not seem to have any beneficial influence. The cases in which I tried it are, however, as yet, not numerous enough to give a final opinion.

Ulcers of the cornea seem to do better when freely irrigated

with the bichloride of mercury solution, especially after cauterization with pure carbolic acid. Iodoform, so highly recommended by others, has never given me any satisfactory results.

In cases of *dakryo-cystitis* or *dakryo cysto-blennorrhæa*, my experience with the bichloride has also been a very satisfactory one.

A CASE OF UN-PIGMENTED SARCOMA OF THE CILIARY BODY AND IRIS.

BY ADOLF ALT, M.D.

Mrs. S., 29 years of age, consulted me for the first time on June 15th of the present year, with the following history: About four years previously she suffered from pain in the left eye and loss of vision. After several weeks of suffering she consulted an oculist, who, as she insists, told her that she was suffering from an affection of the optic nerve which necessitated an operation to save the fellow-eye. From the description she gives, he meant optico-ciliary neurotomy. The eye, however, got better without further treatment. About a year after, a similar attack of pain and dimness of vision occurred, which yielded to treatment, and from her description was an iritis, as probably the first attack had been. She was again comfortable for about a year after this, when another attack came on. Since then this (left) eye has been virtually continually inflamed, the treatment she was under giving her at times comfort, at times being useless.

When first I saw her she counted fingers at 2 feet. There was considerable lachrymation and photophobia, and continued excessive pain. The conjunctiva showed atropine granulations. The eyeball was deeply injected, the iris discolored, the pupil small and irregular, filled with an iritic membrane and bound down to the lens, but pushed forward to some extent into the anterior chamber. In the angle of the iris at about the middle of the lower quadrant there was a very min-

ute dark spot, just raised above the level of the surrounding tissue. Although no specific history could be made out, yet I took this tumor for a beginning gumma and at once instituted vigorous anti-syphilitic treatment. With antipyrine internally she had at least some rest. Under this treatment the inflammatory symptoms subsided, yet, what I had thought to be a gumma remained apparently unchanged. This apparent improvement lasted until July 27th(about 6 weeks)when a new inflammatory attack set in with terrible pain and increased intra-ocular pressure. I now advised an iridectomy in order to counteract the effects of the occlusion of the pupil and to remove, if possible, at the same time the suspicious little raised spot in the iris. To this the patient consulted only after another ten days of terrible suffering. On the 10th of August I made an iridectomy downwards, but found it impossible to remove the little tumor owing to its peripheral position. The result of this operation was an immediate cessation of the pain and comparative comfort for a short period. Then the same old story came on again, and with the new attack of inflammation the artificial pupil closed up again. The pain was terrible and yielded to nothing. The little spot in the iris-angle was evidently growing and now protruded far enough into the anterior chamber to be seen above the corneo-scleral margin. I now advised the removal of the eyeball, believing it certain that I had to deal with a sarcoma of the iris. Upon this advice the patient disappeared for some time. On October 22nd she returned to my office, very much in the same condition, only there was now a distinct tumor of about the size of a pin's head. She confessed having seen two other colleagues and remained under their treatment, since they had promised to cure the eye without any further operation. This they had failed to succeed in and, when at the last visit she had asked them whether they could do nothing else for her, but what they had done, she had received the answer that the only thing remaining was to remove the eyeball. Even now she consented only to have the eye removed, when I told her that this was the only condition on which I would have anything further

to do with her. On October 24th I removed the eyeball with the assistance of Dr. A. C. Robinson of this city. The healing was uninterrupted. The pain and agony have, of course, disappeared.

After the eyeball had been well hardened and cut in two, I found that the tumor of the iris was in connection with a larger one in the ciliary body upon which it sat like the nipple on the breast. The nature of the tumor was that of an un-pigmented spindle-cell sarcoma. The optic nerve was slightly cupped.

From the relation of the tumor in the iris to the original one in the ciliary body, it became clear why, in making the iridectomy, I could not succeed in removing it. The histological character of the new formation corresponds with its slow growth. I am, however, not prepared to state that the first inflammatory attack four years ago marked the beginning of the growth of this new-formation.

TRANSLATION.

In the *Archiv f. Gynæcologie* we find a very interesting article written by Dr. Ludwig Korn "On the Prevention of the Blenorhœa of the Newly-Born." From this paper we make the following extracts: After having given a careful consideration to the method of Crédé, that is the instillation of a two percent. solution of nitrate of silver into the conjunctival sac of the newly-born, the author details at length the experience gained at the Dresden Clinic for Women with Kaltenbach's method, of desinfecting the vagina of the mother with a solution of bichloride of mercury and washing the baby's eyes simply with distilled water. While with this latter method in 3 per cent. of the children a blenorhœa was observed, he states that under the use of Credé's method no case of blenorhœa of the newly-born occurred in 1,600 cases of confinement. The author says: "These figures prove that by means of Crede's method it is possible to positively prevent an ophthalmic-blenorrhœa."

He then goes on to say, that remarks made at the meeting of German naturalists at Muenich by Cohn and Hegar prompted him to make a further series of experiments to solve the question, how best to prevent the blenorhœa of the newly born.

"The method employed was the following: Every woman in labor was carefully cleansed. When possible, they were put into a warm bath. After the hair on the genital organs had been clipped, the external parts were washed with soap and irrigated with a solution of bichloride of mercury of 1 in 1,000. The vagina was washed out according to Kaltenbach's method with a solution of the bichloride of 1 in 3,000. In every case which appeared to be suspicious of blenorhœa I rubbed the mucous membrane of the vagina and cervix well

with my finger while the irrigation was made, as Cohn recommended. During parturition these irrigations were repeated several times—before and after every digital examination. As soon as the head was born the eyelids and the portions surrounding the eyes were scrupulously cleansed by means of cotton soaked in simple hydrant-water, and especially all the smegma was removed. We rubbed the cotton from the outer toward the inner canthus, continually using fresh pledges of cotton until the lids were perfectly clean. We particularly tried to prevent any opening of the eyes before this cleansing by process was finished. In many cases we only succeeded in this pressing the folds of the skin from forehead and cheek towards the eye about to be washed with the thumb and forefinger of the left hand while the washing was done with the right hand.

Then came the problem, how to protect the clean eyes against further contamination. After the child was perfectly born, but before the cord was severed, the whole face and the head of the infant were washed in the way just described. We were thus enabled to disregard these parts altogether when the babe was put into the bath. We soon recognized one of the sources of later contamination in the hands of the babe. I therefore had them held tightly until the whole body was well washed, or I rendered their touching the eyes impossible by wrapping the trunk and extremities in a sheet. After the bath the hands of the baby were again separately washed with soap.

The results were astonishingly good. In one hundred cases no ophthalmic-blennorrhœa was observed.

From this it seemed evident—what Hegar had already stated as his opinion—that very probably the infection of the eyes of the baby does not take place while it passes through the vagina, but that it takes place later, and is, so to speak, artificial, and due to unsatisfactory cleansing. In fact, the eyes of the babe are sufficiently protected to make the entrance of mucus into the conjunctival sac almost impossible. Only a face presentation might favor this accident.

From this reasoning we then abandoned the careful, in our

cases even heightened, prophylactic cleansing of the vagina, and reduced the strength of the sublimate solution to 1 in 4,000. The vagina of every woman in labor was now irrigated with this solution before and after each examination, as had for years been the custom in this institution; the mopping and rubbing of the vagina were totally abandoned. When for some reason no examination was made, no irrigation was made. In such cases we had formerly always used the instillation of a nitrate of silver solution into the baby's conjunctival sacs. Since we had come to suppose that the infection of the eyes does not take place during the passage through the vagina, we could also dispense with the nitrate of silver in these cases. We therefore henceforth simply washed every baby born in this institution in the manner above described with simple hydrant water, without paying any attention to a previous cleansing of the parturient mother. The results remained equally good, as soon as the nurses were well accustomed to the scrupulous compliance with the orders. In the beginning of the series the work was all done by the assistant physician and older nurses, while later on the pupils of the school for nurses did it all.

Up to date we have treated 1,000 babies in the manner described and without *argentum nī ricūm*. Four (0.4 per cent.) of these were affected during the first 4 days of their life by ophthalmic-blennorrhœa. The last case can, however, not be attributed to this method. This baby was born while a Cæsarian section was being performed, and all hands were busy, and it was bathed by a nurse who had come to the institution only a few days previously. It need hardly be stated that she was not yet familiar with the necessary procedures. Deducting, therefore, this case, we had 3 cases of ophthalmic-blennorrhœa in 1,000 babies, equaling 0.3 per cent. This result is much better than Cohn's (1.2 per cent.); but we think it can yet be materially improved upon. Let us look at the distribution of these cases: In the series two cases happened among the first 300. In this way only one case of blennorrhœa happened among the 700 remaining cases. In the last 420 births not a single blennorrhœa was observed.

Ninety-six mothers had not been irrigated, most of them even not in any way been externally cleaned. Often the head was being born already when they entered the institute; almost always parturition took place within a quarter of an hour of their admission. All their babies remained well, although some of them had granular vaginitis or other symptoms which indicated a gonorrhœal infection.

These last cases seem to prove as correct almost to a certainty the assumption of Hegar and Cohn, that the baby's eyes are not infected in its passage through the vagina. * * *

* * * What, now, is the value of the method here described?

We have seen that we reached equally good results even when we ceased washing the outer genital organs or disinfecting the vagina. The pupils of the school for nurses were just as successful with this method as when it was applied by the physicians. It is, therefore, simple and can be learned easily. In it no chemicals are needed, neither the bichloride of mercury, nor the nitrate of silver nor any other disinfectant or caustic. All that is required is some clean surgeon's cotton, which may be replaced when necessary by freshly washed clean linen and the ubiquitous clean drinking water. Every nurse or *sage-femme*, having learned this method, can apply it in her private practice, and we are the more certain that no affections of the eyes will take place, since the danger of carrying the infection from one case to the other is removed. The latter point is of grave importance in a lying-in hospital. It now becomes the duty of all lying-in hospitals and nurses' schools to employ this method and to give the pupils an opportunity to see it used and to learn how to use it.

To sum up the results of our experiments, we may formulate them in the following five propositions:

1. Credé's method of preventing ophthalmoblenorrhœa is absolutely certain and trustworthy when applied in the proper manner.

2. The active part in Credé's method is the nitrate of silver which is a specific against the gonococcus.

3. The infection of the baby's eye with the gonorrhœal poison does not take place in the vagina, but always after birth. Face presentations alone may make an exception to this rule.

4. Simply the most scrupulous cleanliness during birth and the puerperium, especially by the method above detailed, is sufficient to reduce the affections of the eyes to a minimum, and, most probably, it can prevent them altogether.

5. The method is a very simple one and can be learned by every nurse. It should, therefore, especially since no irrigation of the vagina with bichloride of mercury is necessary, be introduced into all nurses' schools."

In *Hirschberg's Centralblatt* we find a report on a work by Dr. M. Borysickiewicz on "Researches Concerning the Finer Structures of the Retina." The summing up of this result seems to us to be important enough to be here reproduced.

A Mueller's fibre begins at the membrana limitans interna and ends as a rod or cone. It is most probable that it passes without offsets through all the layers of the retina. The cells found in these radiating fibres at the height of the inner granular layer are to be considered as inner granules and not as nuclei of the fibres. In the outer granular layer each fibre has only one outer granule in the area of the fovea centralis, outside of it they have sometimes two. The number of outer granules must therefore be larger than that of the rods and cones. It is, however, uncertain whether every fibre contains more than one granule outside of the fovea centralis. The author believes that the outer granules change their positions during life. He even insists upon it, that a rod is changed into a cone by the simple immigration of an outer granule into it.

The author thinks that as the most important point he has proven that the rods and cones are the ends of the radiary fibres and can, therefore, not be of a nervous character. If we, on the other hand, vouchsafe the rods the function of perceiving light, we must grant to the radiary fibres the same faculty.

He further thinks he has proven that the rods and cones can no longer be considered the isolated organs standing by the

side of each other in a regular arrangement, as we have heretofore considered them. By the immigration of granules the ones must be enlarged, the others be pressed aside.

The indirect proofs that the layer of rods and cones contains the light-perceiving organs may just as well be applied to any of the other layers of the retina. This, therefore, forces us to the assumption that the light-perceiving organs must be looked for in the region from the inner granular layer to beyond the outer granular layer, and *within the tubes which are called Mueller's fibres.*

EDITORIAL REMARKS.

The following communication to the *Medical Age* we reproduce here, as the subject is of especial importance to the ophthalmic surgeons. The fraud perpetrated by the "inventors" of this new local anæsthetic is only equaled by the coolness with which a large and well known firm could lend its help to bring the solution into the market, without having previously investigated it. The price charged and received of \$6.00 per ounce, we hope, is not the cause of such an oversight. At any rate, we owe it to Messrs. Parke, Davis & Co. that the fraud has so soon been detected, and we herewith express our sympathy to the colleagues who have been made to suffer by this abominable trick. (See Dr. Jackson's paper in this number).

THE GLEDITSCHINE (STENOCARPINE) SENSATION EXPLODED.

The readers of the *Age* are, doubtless, already familiar with the claims that have been made as to the remarkable anæsthetic and mydriatic properties of an alkaloid said to have been derived from *Gleditschia triacanthos*, and which was at first called stenocarpine (see papers of Drs. J. H. Claiborne, H. Knapp and Edward Jackson, *N. Y. Medical Record*, July 30, Aug. 13, Oct. 1, and *Philadelphia Medical News*, Sept. 3).

While experience with other so-called rivals of cocaine had rendered us rather sceptical as to the validity of the claims made for gleditschine, the glowing reports that had appeared led us to investigate at our laboratory this much vaunted anæsthetic. We accordingly obtained a supply of *gleditschia triacanthos*, from which we were unable to extract but an infinitesimally small percentage of alkaloid, which, on testing, gave no evidence of possessing anæsthetic or mydriatic properties.

The experiments reported in the papers above quoted were all made, we learned, with a *solution* of gleditschine or steno-

carpine. On request to Dr. Seward, the discoverer of the alkaloid, for a sample of this solution, he referred to Messrs. Lehn & Fink, of New York, from whom alone he states a solution of this alkaloid could be obtained.

An analysis of this solution disclosed 6 per cent cocaine and a sulphate of a salt, which, it is probable, further investigation will prove to be atropine.

We have pleasure in submitting in this connection the report of F. A. Thompson, Ph. C., of our analytical department, a perusal of which will make clear the facts above presented, and show physicians who have already published reports on gleditschine that they have been made the victims of a clever hoax. The unscrupulousness of those interested in this fraudulent attempt to impose upon the medical profession can not, we think, be too strongly condemned or the facts too widely published.

REPORT OF F. A. THOMPSON, PH. C.

"Having had placed in my hands a sample of the solution of the new local anæsthetic, gleditschine, I made a chemical examination of this newly-reported discovery, the so-called rival of cocaine, made by Dr. Seward, of Bergen Point, N. J. (I take the liberty here of asking who is Dr. Seward?) I am able to draw the following conclusions in the limited time allowed: The contents of the bottle, measuring nearly a fluid ounce (26.5 C. c.) has a peculiar sweetish odor, and an amber-like color; sp. gr. 1.016 at 59° F., and from its syrupy like appearance, was suspected of containing more than 2 per cent of the salt of any alkaloid.

This is a copy of the label on bottle submitted:

GLEDITSCHIN

C₂₀ H₂₁ NO₃

SO-CALLED

STENOCARPIN.

A new local Anæsthetic.

The salt not being permanent, this 2 per cent solution is recommended.

The name Stenocarpin was given this alkaloid by Dr. Seward, its discoverer, because of the close resemblance which the leaves from which he prepared it bear to those of the *Acacia Stenocarpo*; they have since been identified as belonging to the *Gleditschea Triacantha*.

Recent investigations have proven that in many cases it is preferable to Cocain, and in ophthalmic diseases superior to Atropin.

LEHN & FINK, - - - - - NEW YORK.

Five c. c. allowed to evaporate slowly over sulphuric acid in a closed chamber, until of a constant weight, gave a residue weighing 400 m. g., indicating the presence of 8 per cent of soluble constituents, and in solid form of a dark amber-like color, amorphous, and almost free from odor. The alkaloid of 5 c. c. of the solution precipitated by the addition of a solution of caustic alkali, and shaken out with ether, gave upon evaporation of the several ethereal washings, and dried to a constant weight, an almost white, mostly crystalline residue, weighing 306 m. g., proving the presence of 6.12 per cent of anhydrous alkaloid, equal to about 6.85 per cent calculated as muriate. This residue (alkaloid) was again dissolved in ether, and allowed to evaporate spontaneously, when most of it crystallized into distinct acicular crystals, arranged in stellate form, which is a characteristic form in which its rival *cocaine* (!) alkaloid crystallizes. By a fractional crystallization from ether, about 92 per cent of the total alkaloid was separated as crystalline, the residue remaining in a soft amorphous condition. The separated alkaloids were converted into a muriate from which I have made 7 per cent solutions, and hope to be able to make some physiological experiments to determine if possible the presence of more than one alkaloid, the existence of which in the solution I have reasons for suspecting. A one per cent solution of the crystalline alkaloid, as well as the original solution, was submitted to Dr. Geisel's test for cocaine, of potassium permanganate, but I was unable to produce a crystalline permanganate salt of cocaine, the failure being possibly due to

its impurity, though this test often fails with the pure salt. I was, however, able to perceive the distinct odor of bitter almonds when slightly warmed—another peculiarity of cocaine (hygrin), which I am unable to find ascribed to any other alkaloid. A few drops of potassium permanganate gave the odor of bitter almond, also reducing a large amount of a solution 1 : 1,000.

A solution of 1 : 400 of the crystallized portion in the form of a muriate, produced with *platinum chloride* a yellow precipitate, of feathery-like crystals¹ in stellate form, resembling snow-flakes. *Chloride of gold* produced a distinct precipitate in solution containing one in 3,000, forming small *fern-frond* shaped crystals arranged somewhat in stellate groups. Mayer's reagent, a solution of iodine in potassium iodide; picric acid, and other alkaloidal reagents, produced precipitates of color, etc., peculiar to those ascribed to *cocaine*.

Qualitative tests were also made for sulphate and chloride with positive results, indicating the presence of quite a large percentage of chloride, and only a trace or more of sulphate, which results, as well as the physiological tests, prove almost conclusively that more than one alkaloid is present—probably cocaine hydrochlorate and atropine sulphate or some other mydriatic or even a myotic alkaloid, used possibly to counteract the action of the mydriatic.

Previous to any chemical examination, a few preliminary physiological tests were made upon myself and other self-sacrificing subjects. A drop was placed in the eye and after a few minutes the conjunctiva was thought to be less sensitive to touch. After 15 minutes, the pupil began to dilate, and at the end of thirty minutes, was so completely dilated as to cause considerable pain. This lasted for more than two days, and from its long-continued action left the eye quite sensitive to any strain. About 10 minimis were injected into the fore-arm without any perceptible effect, and when applied to the tongue produced a numbing sensation similar in every respect to

¹ *Amer. Jour. Phar.*, Oct., 1885, Lyons.

cocaine. One drop of the solution was put in the eye of a cat, and within a few minutes the conjunctiva was almost completely blanched and the pupil dilated, which lasted less than 24 hours.

My conclusions subject to further analysis which I hope may identify the exact constituents, are: 1. That the solution, claimed to be a two-percent. of gleditschine, is not what it is represented, and that those introducing it as such are guilty of fraud.

2. That the solution likely contains some coloring agent, differing from that obtained from the drug in which the alkaloid is isolated, or that the color may be due to the presence of an alkaloid, or the substance supposed to be in combination with the cocaine.

3. That the peculiar action of the extracted alkaloid to chemical tests, appearance, taste, and odor, suggest it to be none other than cocaine.

4. That the presence of chloride and sulphate indicates positively that a sulphate of one alkaloid and a muriate of another are present; and the presence of cocaine being established, which is without doubt in the form of muriate, the sulphate can be accounted for only by assuming that it is in combination with *atropine*, or some other mydriatic alkaloid, such as *duboisine*.

5. The solution contains 6.85 per cent. of alkaloid, calculated as cocaine muriate instead of 2 per cent. Gleditschine (!) as stated on label.

6. That the dilatation of the pupil of the eye was thought to be more lasting than from cocaine, and less so than from atropine, indicating the possible presence of some myotic, modifying the action of the mydriatic. Experiencing no dryness of the throat or any hallucinations from the hypodermic injection of the solution, it is possible no *mydriatic* except cocaine is present.

7. That the statement made, that the salt was not permanent, and finding the salt of the alkaloid in this solution quite

so, leads one to suppose that this is not the reason for making such an assertion.

8. That having had placed at my disposal through the firm of Parke, Davis & Co., several pounds of the leaves from which I am unable to produce as yet but a trace of alkaloid giving precipitates with the usual alkaloidal reagents, and which applied to the tongue, produces no sensation whatever, and the existence of a volatile constituent very probable, and a large amount of resinous-like substance having strong astringent properties being present, I question the existence of an anæsthetic or mydriatic alkaloid in *Gleditschia triacanthos*.

No new discovery to my knowledge has received such wide circulation in the medical press in so limited a time, as "*Gleditschine*," and for this reason, it will be unnecessary to give a description of the tree, *Gleditschia triacanthos L.*, from which the leaves are obtained, and the part from which the new local anæsthetic is claimed to have been obtained. Viewing this enterprising scheme of making a 2 per cent. solution of *Gleditschine* as a money-making one, no doubt the perpetrators of the fraud have realized their aim, the solution costing the physician \$6 an ounce, and calculating the cost from the cocaine muriate found in it to be less than 50 cents, a handsome margin is left to the originators.

Without further commenting on this great discovery, I will leave the medical profession to form their own conclusions, advising them, however, to guard against a second *hopeine* swindle."

Respectfully yours,

Detroit, Mich., Oct. 21, 1887.

PARKE, DAVIS & CO.

DR. L. HOWE'S MISSION.

The following paragraph taken from the *Medical Press* of Western New York is herewith brought to the knowledge of our readers. We wish our esteemed collaborator a happy and successful journey and are sure that the investigation was placed in good hands. We eagerly await the results.

"The last census shows that while the population from 1870 to 1880 had increased at the rate of about 30 per cent., during the same time blindness had increased over 140 per cent. Moreover, an examination of the cause of eye disease in this country, shows that here, as elsewhere, a very large proportion is due to contagion.

At the last meeting of the New York State Medical Society a committee was appointed to investigate the causes of the increase of blindness in this country. The American Ophthalmological Society has also appointed a committee for the same purpose, and of both of these committees Professor Lucien Howe, of this city, has been made chairman. By resolution of the State Board of Charities he has also been asked for a special report on the subject in its relation to pauperism. In order, therefore, to study the more dangerous forms of conjunctival trouble it was deemed advisable by the committee to pursue the investigations in the countries where they were most prevalent, especially in certain portions of Asia and Egypt—the latter country above all others offering an excellent field of study. At the request of the President of the American Ophthalmological Society, the President of the New York State Medical Society, Dr. Wier Mitchell, and others, he has been given special letters by the Secretary of State to our Ministers and to the diplomatic corps in Germany, Italy, Egypt and throughout the East, so that being officially accredited, every possible opportunity for observation would be afforded. It is

proposed to study the causes of conjunctival diseases in the light of more recent bacteriological investigations, and for this purpose he will take with him the necessary apparatus, including two or three hundred culture tubes prepared with various media.

Dr. Howe expects to start in December. The entire study will probably be continued over two or three years, although it is possible that he will return next summer in order to begin work at the data which have been collected.

We only wish that other members of the profession in Buffalo were as progressive in their respective lines as Dr. Howe has shown himself to be in his specialty. We shall look forward to important results to be achieved by this investigation."

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

A meeting of the Executive Committee of the Congress of American Physicians and Surgeons, for the purpose of organization, was held on October 5, in the Hall of the College of Physicians of Philadelphia. The special societies were represented as follows:

American Surgical Association, Dr. Claudio H. Mastin, of Alabama; American Otological Association, Dr. Cornelius R. Agnew, of New York; American Ophthalmological Association, Dr. D. B. St. John Roosa, of New York; American Laryngological Association, Dr. J. Solis Cohen, of Pennsylvania; American Neurological Association, Dr. L. Carter Gray, of New York; American Dermatological Association, Dr. I. E. Atkinson, of Maryland; American Climatological Association, Dr. A. L. Loomis, of New York; Association of Genito-Urinary Surgeons, Dr. John P. Bryson, of Missouri; American Association of Physicians, Dr. William Pepper, of Pennsylvania.

The committee was organized by the election of Dr. Pepper as chairman, and Dr. Bryson as secretary.

It was decided to hold the Congress of 1888 in Washington, D. C., on Tuesday, Wednesday, and Thursday, September 18, 19, and 20, respectively. The sessions of the Congress will be held in the evenings, leaving the mornings and afternoons free for the sessions of the special societies participating. The following officers were elected: President—Jno. S. Billings, M.D., LL.D., U. S. A., of Washington, D. C. Vice-Presidents—The Presidents-elect of all the participating societies. Treasurer—Dr. W. H. Carmalt, of Connecticut.

The arrangement of the programme for the sessions of the congress was referred to the President, the Secretary and the Chairman of the Executive Committee.

DONDERS MEMORIAL FUND.

A committee has been formed in the Netherlands in order to celebrate the seventieth birthday of an eminent man of science, Professor F. C. Donders, of Utrecht, on May 27, 1888. On that date the law requires him to resign his duties as Professor at the University and as director of the physiological laboratory, and it is now contemplated on that occasion to connect his name in a permanent way with the spot where he has lived and worked for more than forty years, by the creation of a fund, devoted to a scientific purpose and which shall be known as the "Donders Memorial Fund." The rules and bye-laws according to which this fund is to be governed as well as its more special destination will be drawn up and fixed with the concurrence of Prof. Donders and will be made to correspond most fully to his own wishes.

We trust that his contemporaries and admirers, as well as the foreign scientific bodies, that have conferred their honorary distinctions upon him, and the numerous friends and colleagues with whom he has been more closely associated during his long career of original research and of university teaching, will co-operate with us in honoring a name so well known both in the field of biological science and of ophthalmology.

We have the honor to enclose a list for subscription to the purpose above enunciated and kindly request you to bring this under the consideration of those whom you think might be willing to contribute towards the formation of the "Donders Memorial Fund."

Mr. J. Roell, Member of the States-General, President, The Hague.

Mr. A. D. Van Riemsdijk, Master of the Mint, Secretary, Utrecht.

Dr. P. Q. Brondgeest, Lecturer at the University, Physician, Utrecht.

Dr. A. A. W. Hubrecht, Professor at the University, Utrecht. *Executive Committee.*

The editor of this journal will gladly transmit any contribution to this most commendable enterprise.

CORRESPONDENCE.

OMAHA, NEB., OCTOBER 22, 1887.

EDITOR AMERICAN JOURNAL OF OPHTHALMOLOGY:—Your article (AM. JOUR. OF OPHTH., Feb., 1887) and that of Culbertson (*ibid.*, April, 1887) call for some reply to the supposition advanced by myself that possibly the germs which cause sympathetic ophthalmia may follow the course taken by the posterior lymph stream, in passing from the first to the second eye, *i. e.*, that they leave the optic nerve with the central vessels and pass along these to the cranial cavity, thence to be carried down between the sheaths of the second opticus, by the stream passing from the cranial cavity into the inter-vaginal space.

In both the articles mentioned, in describing eyes enucleated for sympathetic ophthalmia, stress is laid on the absence of marked inflammatory changes in the central canal of the opticus, as evidence against my supposition. But it should be remembered that even if this supposition be correct, the central canal need be involved only in those cases where the injection proceeds from the vitreous of the first eye; in the large proportion of cases where the vitreous is not infected, the germs pass back from the anterior chamber or ciliary body in the choroid and supra-choroidal space to the optic nerve and only after having reaached the inter-vaginal space do they come under the influence of the posterior vitreous stream, which sucks out the contents of this space as it leaves the nerve with

the central vessels. In such cases, therefore, we should expect to find inflammatory changes not necessarily in the central canal, but in the choroid, in the peripheral ends of the nerve sheaths and the inter-vaginal space, especially at the point where the sheaths are pierced by the central vessels, and also in the orbital tissue in the neighborhood of this outlet. Hence, in examining enucleated eyes, special attention should be given to this region. Of course, a negative "find" is of value only in an eye that has caused sympathetic inflammation, not simply irritation. Sincerely yours,

H. GIFFORD.

EDITORIAL NOTICE.

On account of a damaging fire in the publishing house of J. H. Chambers & Co., this number has been very materially delayed.